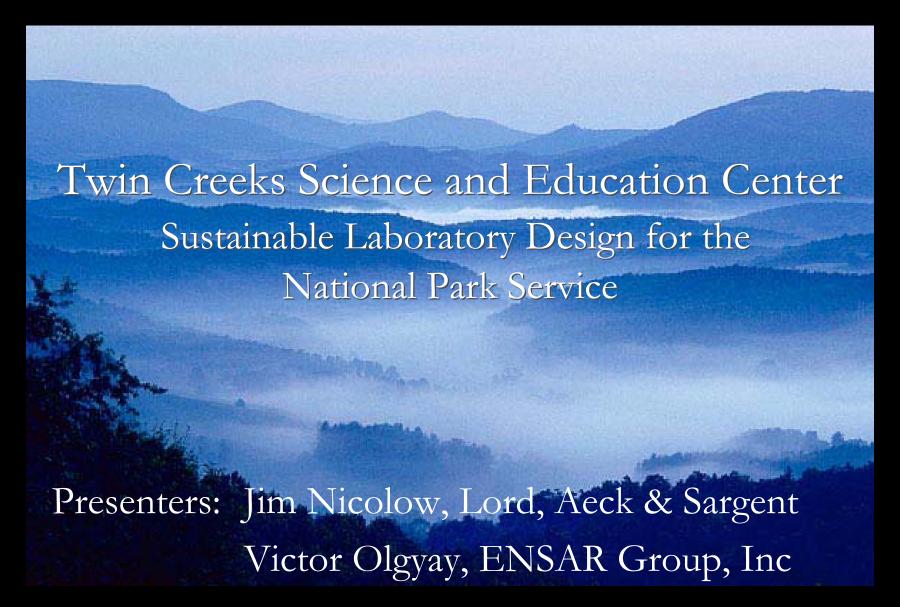
#### Labs21 2003 Conference



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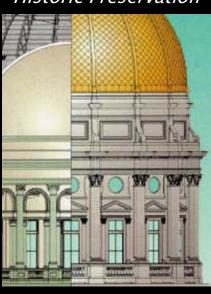
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#### ARCHITECTURE

Education



Historic Preservation



Science



Arts & Culture



RESPONSIVE DESIGN...TECHNOLOGICAL EXPERTISE...EXCEPTIONAL SERVICE

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#### ENVIRONMENTALLY SUSTAINABLE ARCHITECTURE



ENSAR Group, Inc. → 2305 Broadway → Boulder, CO 80304 → 303/449-5226 tel → 303/449-5276 fax →www.ensargroup.com

#### Outline



LABORATORIES FOR THE 21ST CENTURY:

CASE STUDIES

#### Case Study Index

#### Laboratory Type

- of liter too.
- © Dights © Dight recen
- Construction Type
- of liev

#### Type of Direction

- 2 Research/development
- 2 Manhetang
- S Teaching of Chemistry
- of burney
- 2 Dictronic

#### Service Option

- Singered colleg William service combin
- Transfer concentration
- **Featured Technologies**
- a Fume hoods
- M Contrary. M Mechanist systems
- ⇒ Electrical loads
- 2 New constatue 2 Remobile
- w Sortainable
- designiplaneing United generation
- W Daylighting
  W Building commissioning

#### Other Topics

- (2 Diversity factor
- Carton triding

#### of Design process.

- LEED Rating
- O Diet
- Q Shet
- 2 Detroit



#### GEORGIA PUBLIC HEALTH LABORATORY, DECATUR, GEORGIA

#### Introduction

The Georgia Public Health Laboratory GFHL3 in Decatar is a very attractive example of a bright, comburtation, energy-efficient laboratory building. This materium, 66,000-87 clinical testing facility is located on the subskirts of Affanta sear other geocorrected limitation on a busy, multi-use creek. More than 90 personnel conduct about 2.5 million tests each year on even a million specimens in the areas of visologis, parasitology, bacteriology, mycology, and immunology. The CPHL was selected by Reservices of Development Magazine as the 1998 Laboratory of the Year.

This case study of the GPHL is ground toward architects and engineers who are familiar with faltomatory buildings. It is one in a sector produced by Laboratories for the 21st Century, a joint program of the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy (EOE). The one studies exemplify the "Labs 21" approach, which encourages the design, construction and operation of safe, sentiminful, high-performance laboratories.



United States
Environmental Protection
Asserts

United States Department of Energy



- Project Description
- Design Approach
- Technologies Used
- Commissioning
- Measurement & Evaluation
- Summary
- Questions & Answers

#### Location



#### Location



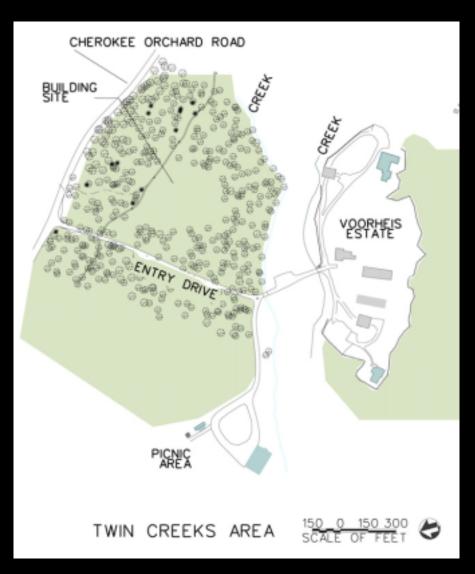
### Site











### ATBI



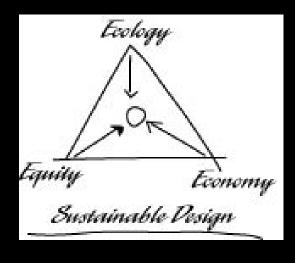
## Program



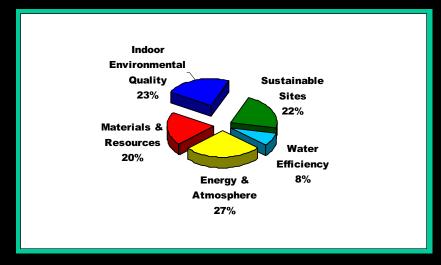
- Area: 15,000 sf
  - Specimen Curation
  - Flex Lab
  - Education
  - Researcher Offices
- Budget \$4 million

## Sustainable Design









## Sustainable Design

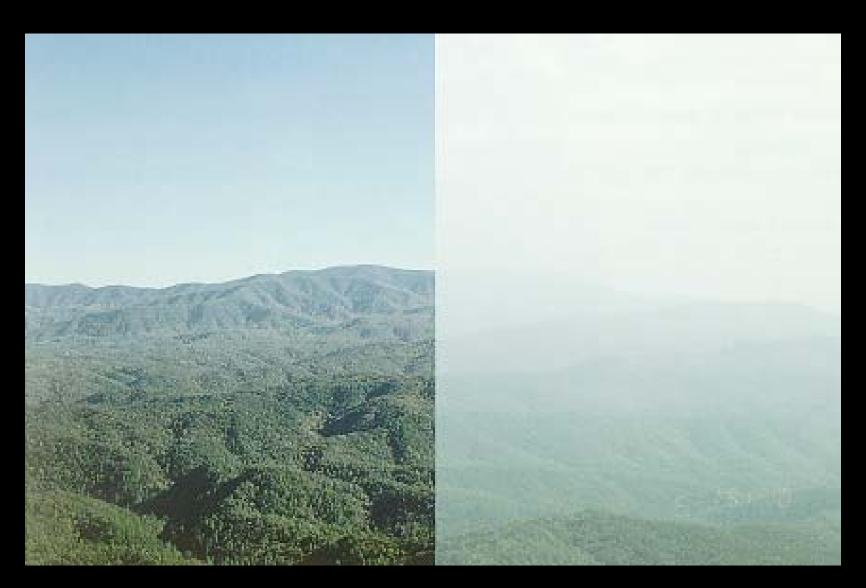






- Consistent with Labs21 Approach
  - Minimize impacts
  - Protect occupants
  - Optimize efficiency
  - Set goals, track

# Design Approach Local Environment



## Local Environment



# Design Approach Local Environment



## Project Goals



## Project Goals

Mission will be accomplished by creating a site sensitive, sustainable facility that:

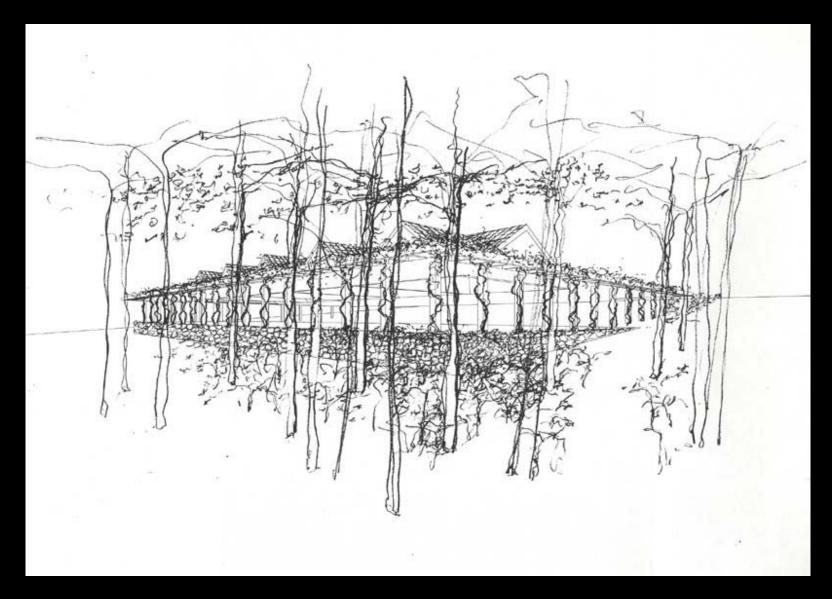
- Fosters cross-discipline intellectual exchange
- Facilitates cross-organizational partnerships
- Enhances both basic and applied research
- Encourages educational opportunities

The Result – a model for other resource-based science facilities.

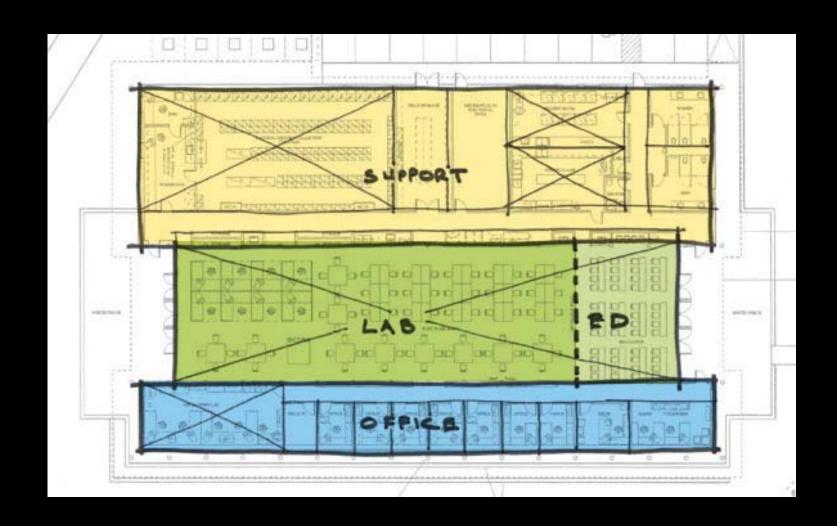
# Design Approach Environmental Goals



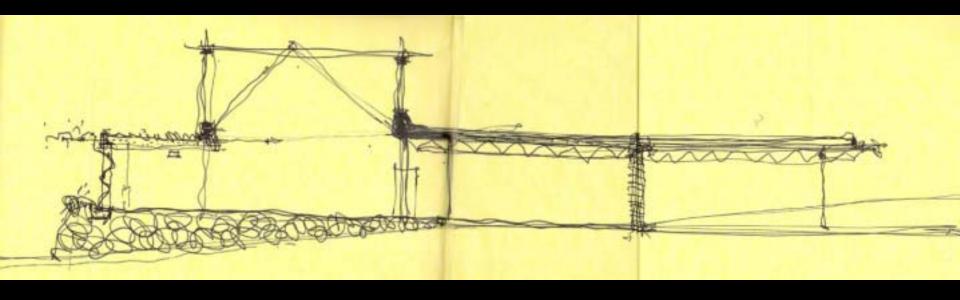
### Site

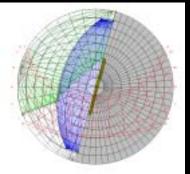


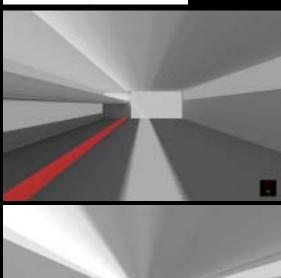
### Plan

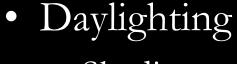


### Section

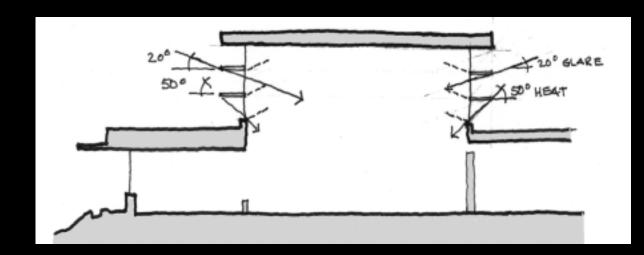


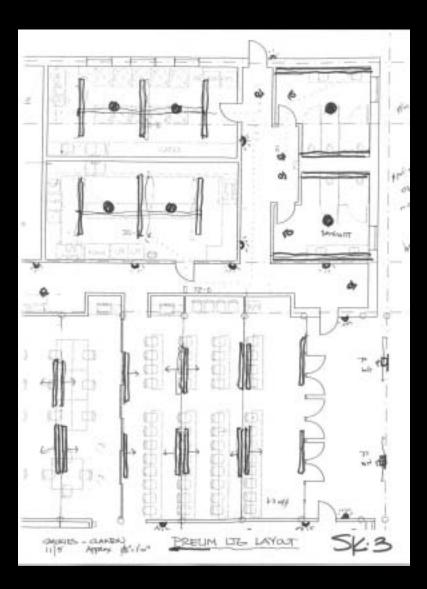






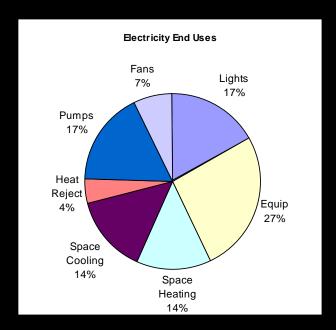
- Shading angles
- Optimized for heat control and glare control

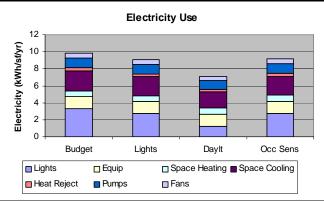




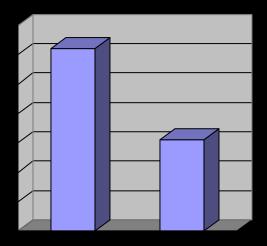
### • Electric Lighting

- Comfortable environment
- Daylight harvesting
- High reflectance
- -1.0 to 1.2 w /sf
- Peak load 50%

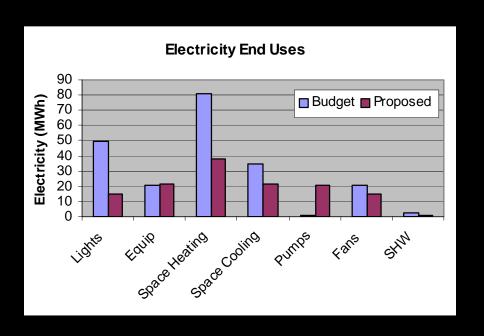




- Envelope optimization
- Parametric thermal analysis /aperture

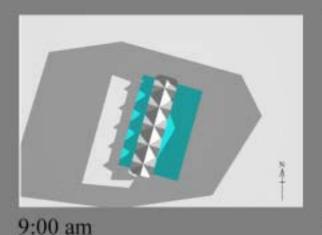


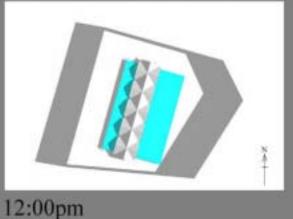
### 9 Energy Efficiency Features

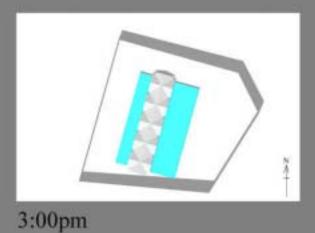


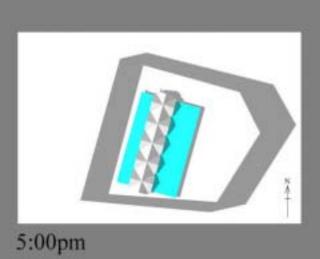
- Highly insulated roof
- High performance windows and external shading
- Energy efficient lighting
- Daylighting controls
- Occupancy sensors
- Natural ventilation
- Ground-source heat pumps
- Premium efficiency pumps and motors
- Solar hot water heating

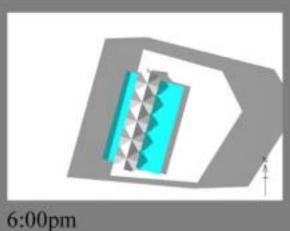


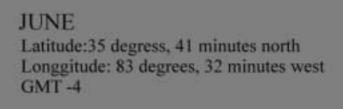


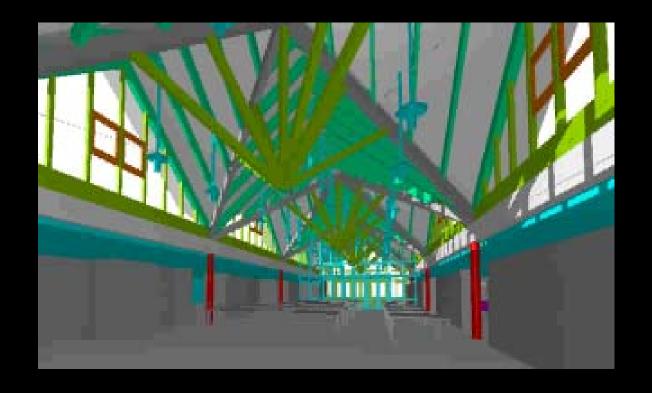




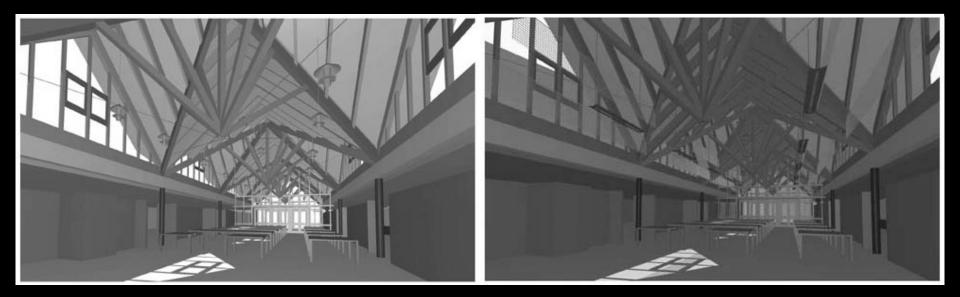


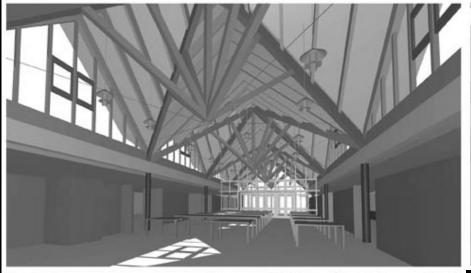


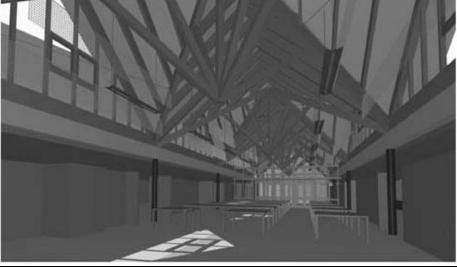


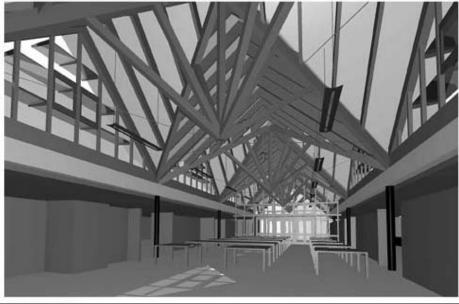


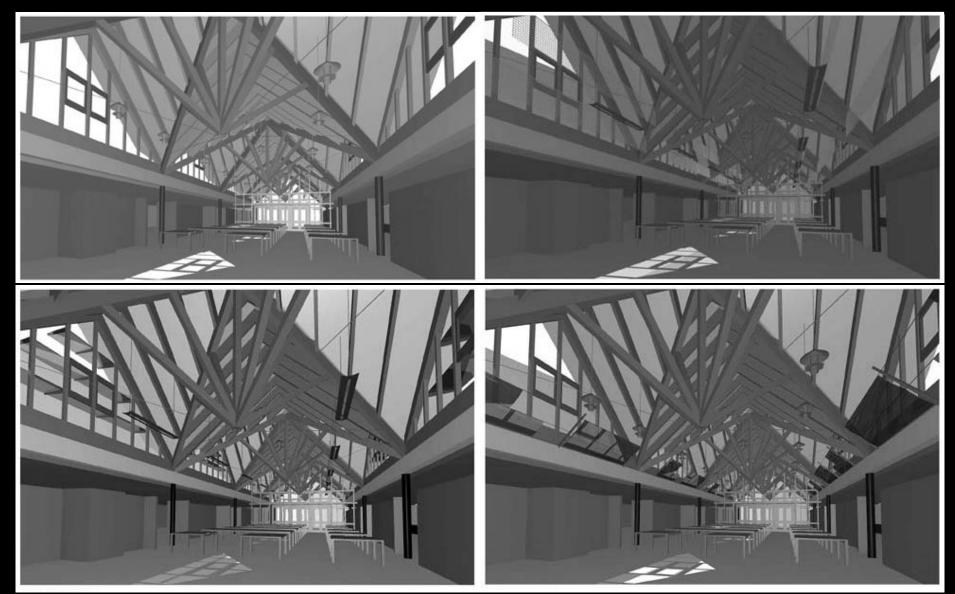






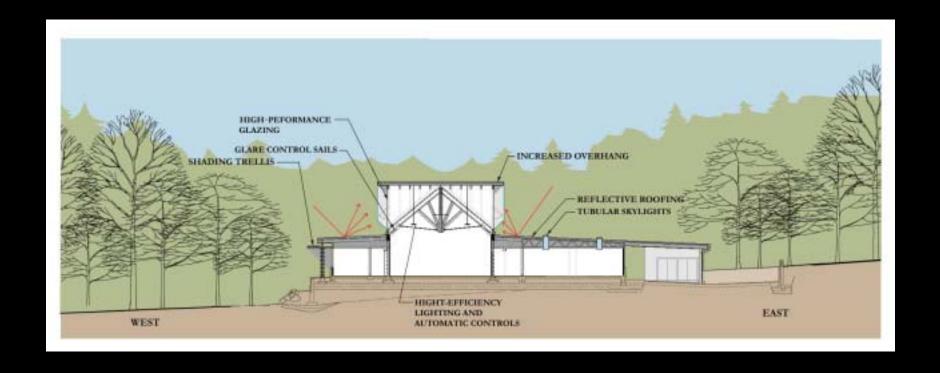




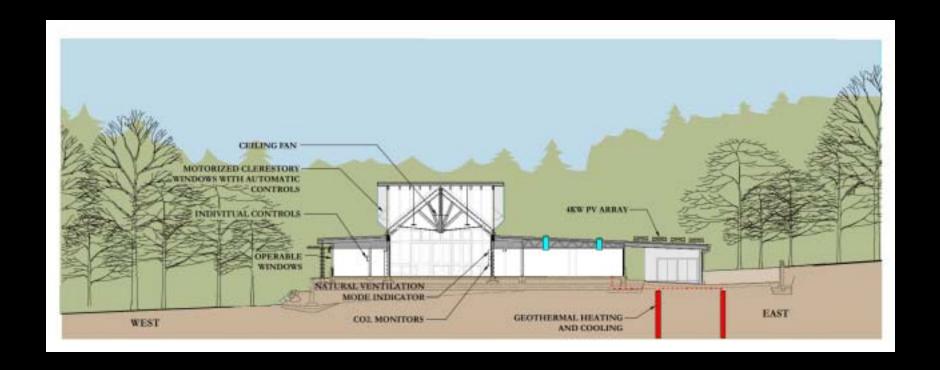


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# Technologies Used HVAC/Ventilation



# Technologies Used

## Plumbing



# Technologies Used

### Stormwater









### Commissioning



Great Smoky Mountains National Park

New Science Center

Preliminary Design Report

Daylighting, Electric Lighting, and Envelope Optimization

#### Prepared Sec

ENSAR Group, Inc. 2305 Broadway Braider, Calorate 80704

with Claster Associates, and Energodal Engineering

#### Propertyl Fern

Lord Aick Surgest 1201 Feachton Street, NY, Suite 200 Albatta, Georgia 16561-3500

November 19, 2002

ENSAR Project #0277



Twin Creeks Education and Science Center Great Smoky Mountains National Park 16800-1 Electrical Systems Commissioning

#### SECTION 16800 - ELECTRICAL SYSTEMS COMMISSIONING

Twin Creeks Education and Science Center Great Smoky Mountains National Park 15950-1 HVAC Testing, Adjusting & Balancing

**SECTION 19930** 

HVAC TESTING, ADJUSTING & BALANCING

Twin Crecks Education and Science Center Great Smoky Mountains National Park 16950-1

Voice and Data Cabling Systems

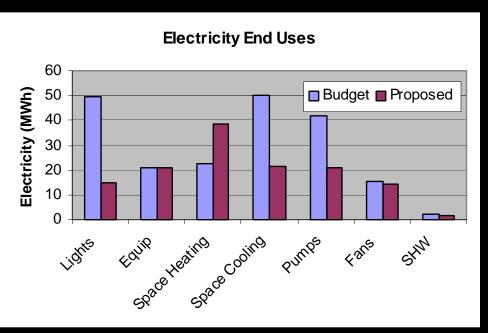
SECTION 16950 - VOICE AND DATA CABLING SYSTEMS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. General provisions and other electrical systems are specified in other Sections of Division 16.
- This Section covers voice and data calding systems.
- C. Specialty systems general provisions are specified in Section 16900, Specialty Systems General.
- Specialty systems commissioning is specified in Section 16990, Specialty Systems Commissioning.

#### Measurement & Evaluation



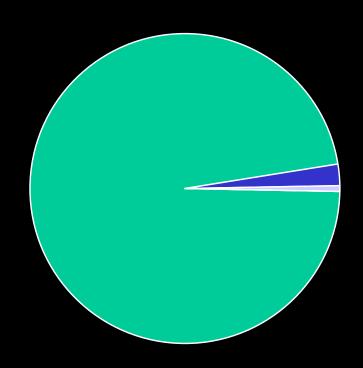
- 47 kBtu/sf Base Case
- 31 kBtu/sf Proposed
- \$5,580/year savings
- 30% water use reduction

## Summary



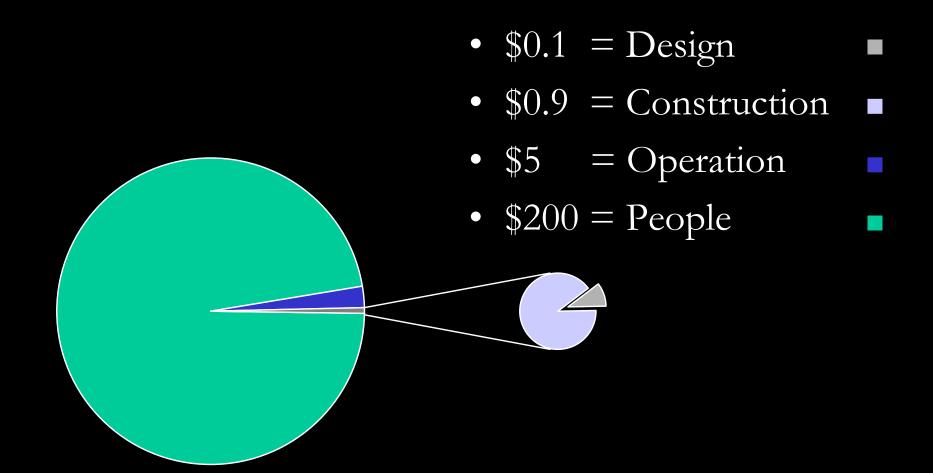
- Commitment
- Set Goals
- Quantitative Analysis
- Why Green?

#### 1:5:200 Rule



- $$1 = Construction \blacksquare$
- \$5 = Operation
- \$200 = People

#### 1:5:200 Rule



# Questions & Answers

